

38. Spicules and two spores of the same.
39. Horizontal section of hymenium of *Boletus luridus*.
40. Utricle of *Boletus scaber*.
41. Spore of ditto.
42. Portion of hymenium of *Hydnum repandum*.
43. Spore of ditto.
44. Portion of hymenium of *Thelephora laciniata*.
45. Ditto of *Thelephora purpurea*, showing an utricle.
46. Ditto of *Clavaria cristata*.
47. Spore and spicule of *Calocera viscosa*.
48. Portion of *Phlebia vaga*, highly magnified.
49. Hymenium of ditto.
50. Sporidium of *Geoglossum difforme*.
51. Sporidia of *Spathularia flavida*.
52. Sporidium of *Leotia lubrica*.
53. Sporophore and spores of *Agaricus trechisporus*.
54. Spores of ditto.
55. Utricles of ditto.
56. Utricle in which the globule has vanished.

IX.—Notices accompanying a Collection of Quadrupeds and Fish from Van Diemen's Land. By RONALD GUNN, Esq., addressed to Sir W. J. Hooker, and by him transmitted to the British Museum. *With Notes and Descriptions of the new Species.* By J. E. GRAY, F.R.S., &c.

MAMMALIA.

1. THE *Thylacinus cynocephalus* is called in Van Diemen's Land indiscriminately by the names of Tiger and Hyæna. It is common in the more remote parts of the colony, and they are accordingly often caught at Woolnorth and the Hampshire Hills. I have seen some so very large and powerful, that a number of dogs will not face one. They are usually nocturnal in their attacks on sheep, but they also move about in the day time; and upon those occasions, perhaps from their rather imperfect vision by day, their pace is very slow. A number of skins could be procured if much wanted, or their skulls perhaps more easily. In Murray's Ency. of Geography it is stated, p. 1485, that its *tail is compressed*, which suggests the supposition that it is used in swimming. The tail is *not* compressed, neither is it at all aquatic in its habits. They are most numerous *inland*, and when I was recently at the Hampshire Hills two were caught in one week at the sheep, twenty miles from the sea. As to their feeding on fish, I

hardly know how it could have been ascertained, unless the fish had been previously caught and given to one, when, like many carnivorous quadrupeds, it is probable it would eat them. Deductions are frequently too hastily drawn by naturalists (or persons professing to be such) from isolated facts. That the *Thylacinus* may often be seen on the sea-coast, as also every other species of our quadrupeds, is quite probable, and may once or twice have been seen eating a dead fish thrown up by the sea; but as to its *fishing*, it is out of the question.

2. (*Phalangista Cookii*?) is common near Launceston, and is there usually called Ring-tail Opossum as a specific name. All the opossums come out of the holes of the trees, in which they usually sleep all day, about twilight; and for an hour or two after sunset they may be seen busily employed eating the leaves of the various species of *Eucalypti*: on the branches on moonlight nights they are usually shot, and opossum shooting is sometimes fine sport where a few join together. Orchards in country places suffer sometimes from the opossums eating all the leaves and young branches.

3. (*Phalangista Vulpina*.)—The habits of this species are described under No. 2. It is the most common species near Launceston, and there usually called Brush-tail Opossum.

9. (*Phalangista fuliginosa*, Ogilby?)—Iris reddish brown. It is the kind from Circular Head, and some specimens attain a size fully as large as No. 3. At Circular Head I have seen neither Nos. 2 or 3. A small species of *Phalangista* (*Phalangista nana*, Geoff.?) exists in Van Diemen's Land about the size of a large mouse; but although I have seen some alive in the possession of gentlemen, I have been unable to procure a specimen. No species of *Petaurus*, or flying opossum, exists in Van Diemen's Land, although one species, *P. sciureus*, is abundant at Port Philip and along the south coast of New Holland.

6. *Perameles Gunnii*, Gray. Bandicoot.—The bandicoots are very numerous everywhere; they burrow in the ground universally as far as I have seen, and live principally on roots. I knew one gentleman's entire collection of Cape bulbs, principally *Babiænae*, eaten by them, and I suffered considerably

myself, having lost some entire species of bulbs through these animals.

4. *Phascolomys*, Wombat.—Commonly called in the colony by the name of badger. I found this animal in very various situations, on the tops of mountains and in dense forests. In the mountains it finds holes among the rocks in which it can lodge, but in other places it burrows in the earth. It is usually nocturnal I believe, but I have frequently killed them in the day time; their pace is slow, and on being attacked they grunt somewhat like a pig. The skin is excessively thick, and curiously attached to the bones of the hips, as also slightly along the vertebræ of the back. At the hips however you have to cut through solid gristle. The whole skin has to be cut off, as it will not separate from the flesh like the skins of most other animals. The eyes are unusually small, iris dark brown. I obtained a very large one recently at the Hampshire Hills; but the man to whom I gave the skin to immerse in a decoction of bark, put it in the warm liquor, thereby destroying its value: to such losses a person is always subject. It measured thirty-six inches from snout to tail, and thirty-four inches in circumference round the body. Wombat flesh is very good to eat, and I have upon many occasions made hearty meals of it when out in the woods. The aborigines were also fond of it. The molares are remarkable, and by extracting one you will see how curiously they go into the lower jaw; at least they appear so to me, being semicircular and long.

I saw one or two specimens of an animal brought from the south coast of New Holland bearing a general resemblance to the wombat, in being tailless, (the Koala, *Phascolarctos cinereus*?) but I think the toes differed in some points, and it lived on the tops of the trees like the opossums. Its cry at night, I was informed by the gentleman who shot it, was not unlike some of the *early notes* in the braying of an ass.

4*. *Dasyurus ursinus*, the Devil.—I have only been able to procure a young specimen of this species. It exists all over Van Diemen's Land, and naturalists are wrong in supposing that because it, the *Thylacinus*, and some others are found on the sea coast, that they exist there only. The sea coast is certainly the part most likely to be visited by voyagers, but

an inference should not thence be drawn that they only live on the sea coast, and feed on dead seals, &c. I know of no species that exclusively inhabits the sea coast. The *devil* is destructive to sheep all over the colony, and is indeed the most destructive of our indigenous quadrupeds, the *Thylacinus* being much scarcer. The *D. ursinus* is nocturnal, very fierce, and a match for an ordinary dog; they bite very severely.

5. (*Dasyurus Viverrinus*), the Native Cat of Van Diemen's Land.—Of this animal I think there are many species, differing in size, colour, &c. (*Dasyurus Maugei*;) they are very destructive to poultry throughout the colony, entering fowl-houses by the smallest aperture, and killing an immense number; they only suck the blood, and rarely, if ever, are known to carry off the bodies.

7. *Hydromys chrysogaster*, Water Rat.—I am ignorant of its habits. Found in rivers and streams.

9. *Echidna*.—I have only sent home one miserable specimen of this animal. It is common in some parts of the colony, and I am informed by those who have eaten them that they are excellent food. They are harmless.

10. *Kangaroo*.—Of this genus I know four species in Van Diemen's Land, or perhaps there may be more. The specimen sent is the species known in Van Diemen's Land by the name of "Wallaby." I shall however to a certain extent describe all. First, the forest kangaroo (*Macropus major*, Shaw,) called also the "boomer," (from the heavy sound in jumping, I presume,) the "forester," and various other names. It is a very large species, frequently exceeding 70lbs. weight; the colour very light mouse colour. It exists on the top of the Western Mountains, and in the more remote parts. On the Western Mountains I saw them in great numbers, and the country being perfectly open I had some beautiful hunting; but in some cases they completely outstripped the kangaroo dogs, which are a cross between the greyhound for speed and bull-dog for strength. I had a tame one which allowed my children to play with it, and was extremely docile. The tail is *not* used in progression, although universally asserted; in leaping they usually hold it out pretty horizontal, but never as a third limb. Indeed, in defence, the hind legs alone are

used, with which they can give most powerful strokes, and a very large kangaroo will keep off in a favourable situation one or more dogs. Kangaroos, although, from circumstances of their food being abundant in spots, as on recently burnt land, they may be seen in flocks, are not gregarious; their food brings them to one spot, but you never see even *two* together properly speaking; and on no occasion have I ever seen or known them in flocks, owning a leader and proceeding *en masse*, as all wild animals do. They are perfectly independent of each other. Kangaroos do not burrow in the ground, although it is so asserted in various works: they lodge during the heat of the day amongst high ferns, such as *Pteris esculenta*, high grass, and in underwood, commonly here called *scrubs*, that is, dense patches of *Melaleuca*, *Leptospermum*, &c., on the margins of streams, &c. And although almost all our forest trees (*Eucalypti*) are hollow at the butt, and innumerable dead and hollow trees cover the ground, I have never known them use them as sleeping places, as is but too frequently asserted: under a dead tree is however much more likely than in the hollow of a live one. Many other assertions, probably equally devoid of foundation, are constantly made by authors, who are but too frequently mere compilers from the assertions of others; and I can assure you even in Van Diemen's Land I receive every statement on natural history subjects with the greatest caution. There is so great a want of investigation, joined to a natural proneness for the marvellous, that a simple fact is perverted to such a degree, that it would puzzle any one to tell how much was really founded on fact.

The next species in size is commonly called the Brush Kangaroo (*Halmaturus?* —?). It is by far the most common everywhere, easily overtaken by swift kangaroo dogs, and used most generally for food. When roasted or the tail made into soup, it bears a pretty close resemblance to hare, and is universally esteemed. It is however usually cut up like mince meat, with salt pork, pepper, &c. and stewed, and is colonially called a steamer; in this way it is really delicious. The skins are tanned and is the only kind of leather used in the colony for the uppers of ladies' and gentlemen's boots and shoes. Many thousands of skins are also annually exported from Van Diemen's Land to New South Wales for the same purpose.

The kangaroos usually feed at night, and in the evenings and mornings, but they are exceedingly sharp-sighted in the day time.

The third species is the "*Wallaby*," of which a specimen is sent. It is of a much darker brown, smaller than either of the preceding, and is most common near the sea, and on the islands in Bass's Strait. They are excellent eating, but the smallness of the skins renders them less valuable for tanning.

A fourth species, commonly called *Kangaroo Rat*, may prove to be of the genus *Hypsiprymnus*; they are considerably smaller than the wallaby, but progress on their hind legs similar to the kangaroo. There may, in reality, be some other species, but I have not closely examined many specimens. Their mode of bringing forth young, &c. is now so much better known in England than out here, that I need make no remarks on the subject.

Milk-white or cream-coloured kangaroos (*Halmaturus albus*, Gray,) exist in Van Diemen's Land, although but sparingly. I also possessed a *white* opossum of No. 3 alive, which I gave Mr. Short to take to England. I had previously possessed a white skin. I presume them all to be albinos.

Notes on the above, with descriptions of two new Species.

By J. E. Gray, F.R.S.

The above paper contains the best remarks on the Mammalia of Van Diemen's Land that I have seen, and corrects several inaccuracies into which naturalists have fallen from not having the opportunity of examining the animals on the spot. Among the collections are two new species, which I shall now proceed to describe. Having occasion some years ago to consult the original description of the wombat given by Bass in Collins's Account of New South Wales, ii. 155, I found that all the difficulty which has occurred with respect to his animal is occasioned by a simple misprint of *five* for *two* in his description, by which he is made to say that the animal "has *five* long grass-cutting teeth in the front of each jaw, like those of a kangaroo; within them is a vacancy for an inch or more; then appear *two* small canines, of equal height with, and so much similar to, *eight* molares situated behind them, as scarcely to be

distinguished from them. The whole number in both jaws amount to twenty-four." It is evident from his whole number that the cutting-teeth should have been two and not five, as they are in the wombat described by Geoffroy. Illiger, (Prodromus, 77,) overlooking this misprint, and being aware that no known Mammalia have an odd number of cutting-teeth, describes his genus *Amblotis* as having six teeth in each jaw. Succeeding naturalists have been inclined to believe that Illiger and Bass's animal is to be discovered. I have seen Bass's specimen, which is now in the Museum of the Natural History Society of Newcastle-on-Tyne: it is the same as the one we now usually receive from Van Diemen's Land, only discoloured by having been kept in spirit.

It is to be regretted that no specimen of No. 2 was sent, as there are two different species confounded under the name of *P. Cookii*, one coming from Van Diemen's Land, which must be called the real *P. Cookii*, as it is the opossum of Van Diemen's Land described by Cook, last Voyage, i. 108, t. 1; from this arises the Phalanger de Cook, Cuv. Règ. Anim., i. 179; *Phalangista Cookii*, Temm. Monog., i. 7. The other, which was found near the Endeavour River, New Holland, may be called *Phalangista Banksii*; it is the New Holland opossum of Pennant (Quad., ii. 25.), the Opossum of Hawkesby, Voy., ii. 586, and probably the *Balantia Cookii* of Kuhl. (Beitr. 63.) Capt. Cook thought that the Van Diemen's Land animal might be the male of the one discovered by Sir J. Banks in New Holland. Dr. Shaw, in his white-tailed opossum, has partly combined Pennant and Cook's descriptions. Cuvier refers to Cook's plate; and Temminck says that he described a specimen brought home in Capt. Cook's expedition which is now in the Leyden Museum.

9. *Phalangista fuliginosa*, Ogilby? Back and tail black; sides brownish; throat, chest, and belly yellowish brown; under side of the tip of the tail bald.

6. *Perameles Gunnii*, Gray. Muzzle elongate, conical, tapering, grey-brown, with scattered black tipped rigid flattened bristles; lips, throat, belly, inside of the legs, feet, tail, and four broad bands on each side of the rump white; front claws elongate, slightly arched, yellow; ears moderate, rather naked,

brown and hairy in front; the thumb of the hand feet small, subcylindrical, blunt, clawless. Length: head, 5; body, 11; tail, $4\frac{1}{2}$; hind feet, $2\frac{1}{2}$ inches.

These animals have been generally supposed to feed on insects, and Dr. Grant discovered the remains of insects in the stomach of the one he examined.

The "*Wallaby*" kangaroo is quite different from the species which usually goes by that name in this country, and proves to be a species which I have not before seen, belonging to the subgenus *Thylogale*; therefore I shall characterise it.

Halmaturus (Thylogale) Tasmanei, Gray. Blackish brown, reddish and black varied; upper lip, chin, throat, and beneath pale reddish brown; hind feet short, brown, grizzled; tail rather short, scaly, covered with short close-pressed hairs, with longer soft crisped hairs along the upper part of its base. Length, 25; tail, 10?; hind feet, $5\frac{1}{2}$ inches.

This species is very different from any of the specimens which I have described in my lately-published revision of the family, and if the tail is not injured it will agree in the shortness of this member with the *H. Thylogale brevicaudatus*, the *Kangaroo à queue courte* figured by Quoy and Gaynard in the *Voyage of the Astrolabe*, (Mammalia, t. 19,) but which is quite differently coloured.

FISHES.

I have this season, from my residence being so near the sea, procured a few fish, but have not numbered them. They were all caught in a seine at Circular Head except one species, called a "*Nurse*" (*Cestracion Philippi*, Cuv.); I caught it at Western Port. Another species of shark, called here *Sword Fish*, (*Pristis cirrhatus*, Lath.) is abundant; the peculiarly prolonged and armed snout struck me as curious: three specimens are sent. A fish called *Sea Hedge-hog* or *Porcupine* (*Diodon*) is also very abundant. On being brought to land it inflates itself into a perfect sphere, the skin as tight as a foot-ball, and the spines erect and stiff in all directions from the body: it continues so for some time. Some of the skins now sent are well-preserved.

"*Leather Jackets*" (*Monacanthus*, Cuv.). Of these, two are

this year sent. They are of a greenish colour, with a strong spine on the back.

“Parrot fish” (*Ostracion*, Linnæus,) so called from the shape of the head and mouth I suppose, as also perhaps from the various and beautiful colours. Of these I send twelve specimens of two or three species; one specimen, although much faded and altered, is still very beautiful.

“Sea Horse,” so called, I believe, from a fancied resemblance of the shape of the head to that of a horse. The specimen this year sent I picked up on the beach a few miles from Circular Head; it is of a different species to those usually caught in the rivers Tamar and Derwent. The tail differs considerably.

I think few, if any other, marine productions require notice. I cannot and do not devote much time to the pursuit, but I plainly see that much might be done. To a sincere lover of natural history, possessed of knowledge and the necessary means, a finer field than Van Diemen's Land could scarcely be found. Crabs are very various and curious; fish also. And indeed a good cask of spirits might be filled with sundries highly interesting to a scientific person.

Notes on the Fish. By John Edward Gray, Esq.

“The Nurse” is *Cestracion Philippi* of Cuvier, the *Squalus Philippi* of Schneider, figured as the Port Jackson shark in Philipp's Voyage, t. at p. 283. It is probable from their descriptions that neither Cuvier, Müller, nor Henle have ever seen this species, but were only acquainted with it from the figure above-cited; it is perhaps the only specimen now in European collections. It is much more nearly related to *Scyllium* than any other of the sharks. I am therefore induced to give the following description of the specimen sent by Mr. Gunn.

Cestracion Philippi: muzzle short; nostrils large, near the lips operculate; operculum subspiral (partly injured in the skinning); events? very small, low down on the cheek under the hinder angle of the eye; front teeth small, conical, compressed, lancet-shaped, the larger one with a small lobe on each side of its base; eyebrows elevated, ridge-like. Dorsal fins two, each with a spine in front; anal fin one; caudal fin deeply lobed: the front dorsal fin over the middle of the space

between the large pectoral and ventral fin, the second over the middle of the space between the ventral and anal fins. *Respiratory slips* five, the three hinder ones over the base of the pectoral fins: skin rough, grey, with two very indistinct darker lines on each side of the tail. There is a second species of this genus, from China, which I have described in my Zoological Miscellany, under the name of *Cestracion Zebra*, figured in Hardwick, Drawing of Cartilaginous Fishes, t. 5, which differs in the body being marked with broad black cross bands.

The "parrot fishes," or *Ostracions*, consist of three very distinct and beautiful species allied to *Ostracion auritus* of Shaw (Nat. Misc., ix. t. 338), for which I have formed a sub-genus under the name of *Aracana*.

1. *Ostracion (Aracana) ornata*, Gray. Granular, white, with hexangular spots, leaving whitish reticulations; face and belly with alternate unequal dark and white oblique streaks; fins pale; front of dorsal and anal fin dark; caudal fin with a dark submarginal band and dark streaks between the strong caudal rays.

2. *Ostracion (Aracana) flavigaster*, Gray. Granular, pale, with dark longitudinal lines; under lip, throat, and beneath yellow; fins all whitish; front of anal and dorsal fin rather clouded; caudal rays slender.

3. *Ostracion (Aracana) lineata*, Gray. Rough, with tessellated ridges; whitish back, with irregular black marks; face and sides with crooked black streaks; belly and lower lips white; fins all whitish; rays of caudal fin slender; base of tail with three black streaks.

In some specimens of this species the spines (which agree in number and position in all these species) are very short and tubercular, and only rudimentary.

The specimen of *Ostracion auritus* figured by Dr. Shaw, is in the British Museum collection; it appears to be most allied to the last species, but differs from it in being larger and covered with small granules, and is of a nearly uniform brown colour; but this may arise from some imperfection in its original preservation.

In the British Museum there is also a fifth species of this section, sent from China by Mr. Reeves, which I figured in

the Indian Zoology (in t. —) under the name of *O. (Aracana) auritus*. On comparison with these species it proved to be very distinct, and therefore I propose for the future to distinguish it as *Ostracion Reevesii*. It is much larger than any of the Australasian species. It is regular, granular, with three smooth rather arched bands on each cheek; in its present dry state it is of a uniform whitish grey colour, and much compressed, and higher than the species above described. The rays of the caudal fin are thick. Besides those named in the list there was also sent an *Apistes*, which appears to be new; it may be called *A. Tasmanensis*, Gray: when dry, lead colour, scaleless, suborbital and preopercular spine very long, produced; middle of dorsal fin with a large black spot; palatine teeth velvet-like.

Brit. Mus. Feb. 10, 1838.

X.—*On the Existence of Spiral Vessels in the Roots of Dicotyledonous Plants.* By the Rev. J. B. READE, M.A., F.R.S.

To Richard Taylor, Esq.

Peckham, Feb. 10, 1838.

My dear Sir,

IN the few explanatory remarks which I ventured to offer in *Philosophical Magazine* for Nov. 1837, on the chemical composition of vegetable membrane and fibre, I had occasion to allude to the existence of spiral vessels in the roots of dicotyledonous plants. The attention of English botanists being hereby directed to a statement somewhat at variance with received principles, I have been requested to furnish a more detailed account than the nature of my former communication permitted. I must beg, therefore, to avail myself of your valuable pages.

It has been usual to consider spiral vessels as peculiar to the structure of monocotyledonous roots, and as forming a distinctive character between the root and the stem of dicotyledons; and so thoroughly has this opinion of their position gained credit, that I have been able in no case to remove it but by giving ocular demonstration that it is in opposition to facts.

An attempt to trace to their origin the spiral vessels in the